

***MTCA/SMS integration (Residual issue)***

**As Identified in Issue Paper (June 2009)**

- **Cleanup Goal:** The SMS needs to be clarified regarding what cleanup goal must be met within a specified time frame. This includes clarification that the SQS is the cleanup goal with certain caveats by harmonizing the following sections:
  - WAC 173-204-580(3)(a)(ii) refers to a time frame of meeting cleanup standards within ten years.
  - WAC 173-204-580(3)(b) allows for an extended time frame if certain conditions are met.
  - WAC 173-204-570(3) requires that the minimum cleanup level is the maximum concentration of a contaminant allowed at the site by year ten after the cleanup action.
  - WAC 173-204-570(2) requires that the cleanup objective must be the SQS as defined in WAC 173-204-320 through 340.
  - WAC 173-204-570(4) allows for a cleanup standard to be set as close as practicable to the SQS but not to exceed the minimum cleanup level within a preferred 10 year time frame.
  - WAC 173-204-500(4) identifies the policy of the department to manage sediment cleanup actions towards the goal of reducing and ultimately eliminating adverse effects on biological resources and significant health threats to humans from sediment contamination. To achieve this goal, the department will pursue sediment cleanup decisions and cleanup standards that are as close as practicable to the sediment quality standards of WAC 173-204-320 through 173-204-340,

**Current Language:**

**Section 173-204-570(3)** Minimum cleanup level. The minimum cleanup level is the maximum allowed chemical concentration and level of biological effects permissible at the cleanup site to be achieved by year ten after completion of the active cleanup action.

**Proposed Language:**

**Section 173-204-570(3)** Maximum allowable level. The maximum allowable level (MAL) (formerly “minimum cleanup level”) is the maximum allowed chemical concentration and level of biological effects that is permissible at a site after completion of the active cleanup action. This is the upper end of the range for setting cleanup standards.

**Remedial Investigation/Feasibility Study integration**

Under WAC 173-204-560(4)(f)(iii)

(iii) A phased approach for evaluation of alternatives may be required for certain sites, including an initial screening of alternatives to reduce the number of potential remedies for the final detailed evaluation. The final evaluation of cleanup action alternatives that pass the initial screening shall consider the following factors:

- (A) Overall protection of human health and the environment, time required to attain the cleanup standard(s), and onsite and off-site environmental impacts and risks to human health resulting from implementing the cleanup alternatives;
  - (B) *Permanence, the degree to which the alternative permanently reduces the toxicity, mobility or volume of contaminants, including the adequacy of the alternative in destroying the contaminants, the reduction or elimination of contaminants releases and sources of releases, the degree of irreversibility of waste treatment process, and the characteristics and quantity of treatment residuals generated.*
  - (C) Attainment of the cleanup standard(s) and compliance with applicable federal, state, and local laws;
  - (D) Short-term effectiveness, including protection of human health and the environment during construction and implementation of the alternative; and
  - (E) Long-term effectiveness, including degree of certainty that the alternative will be successful, long-term reliability, magnitude of residual, biological and human health risk, and effectiveness of controls for ongoing discharges and/or controls required to manage treatment residues or remaining wastes cleanup and/or disposal site risks;
- ~~g) Ability to be implemented. The ability to be implemented including the potential for landowner cooperation, consideration of technical feasibility, availability of needed off-site facilities, services and materials, administrative and regulatory requirements, scheduling, monitoring requirements, access for construction, operations and monitoring, and integration with existing facility operations and other current or potential cleanup actions;~~
- ~~(h) Cost, including consideration of present and future direct and indirect capital, operation, and maintenance costs and other foreseeable costs;~~
- ~~(i) The degree to which community concerns are addressed;~~
- ~~(j) The degree to which recycling, reuse, and waste minimization are employed; and~~
- ~~(k) Environmental impact. Sufficient information shall be provided to fulfill the requirements of chapter 43.21C RCW, the State Environmental Policy Act. Discussions of significant short-term and long-term environmental impacts, significant irrevocable commitments of natural resources, significant alternatives including mitigation measures, and significant environmental impacts which cannot be mitigated shall be included~~

**MTCA/SMS terms integration****New definition:**

Bioassay: An assessment of conditions and/or factors potentially affecting organisms or assemblages of organisms (communities) using measurable attributes associated with those organisms. This includes but is not limited to laboratory tests and field evaluations of living plants, animals, and other organisms. Also included are evaluations of indigenous field organisms for long-term effects, assessments of biological effects resulting from bioaccumulation and biomagnification, and/or extrapolated values or methods for simulating effects from prolonged exposure periods.

**Current definition:**

"Bioassay" means a test procedure that measures the response of living plants, animals, or tissues to a sediment sample. **(retain??? Open for discussion)**

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**New definition:**

Biological Toxicity Test: A test procedure that measures the toxicological response of living plants, animals, other organisms, tissues or subsystems exposed to discrete samples potentially containing toxic compounds. **(Do not use?? Open for discussion)**

**Current definition:**

None ---NOTE May replace "Appropriate biological tests" term. **(Do not eliminate?? Open for discussion)**

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**New definition:**

Chronic bioassays: Biological assessments which measure the effects upon organisms or their populations conducted over prolonged exposure periods relative to the life span of the organism. **(potential discard)** ~~Chronic effects related to sediment exposure may include mortality, reduced growth, impaired reproduction, histopathological abnormalities, benthic community impairment and other adverse effects to organisms as determined appropriate by the department.~~

**Current definition: (retain current definition)**

"Chronic" means measurements of biological effects using sediment bioassays conducted for, or simulating, prolonged exposure periods of not less than one complete life cycle, evaluations of indigenous field organisms for long term effects, assessment of biological effects resulting from bioaccumulation and biomagnification, and/or extrapolated values or methods for simulating effects from prolonged exposure periods. Chronic effects may include mortality, reduced growth, impaired reproduction, histopathological abnormalities, adverse effects to birds and mammals, or other endpoints determined appropriate by the department.

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**New definition:**

Acute bioassays: Biological assessments which measure the effects upon organisms conducted for exposure periods that are relatively short in comparison to the life span of the organism. **(potential discard)** ~~Acute effects may include mortality, larval abnormality, or other endpoints determined appropriate by the department.~~

**Current definition: (Retain current definition?? Open for discussion)**

"Acute" means measurements of biological effects using surface sediment bioassays conducted for time periods that are relatively short in comparison to the life cycle of the test organism. Acute effects may include mortality, larval abnormality, or other endpoints determined appropriate by the department.

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**New definition:**

Sediment: Any particulate matter which has been deposited or is present as particles on the bed or bottom of a body of water that a) exists for a minimum of six contiguous weeks on an annual basis or b) is at or below mean annual flood level or c) is at or below the highest high tide level.

**Current definition:**

None

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**New definition:**

Surface Sediment: Sediment located in the biologically active zone or exposed to the water column.

**Current definition:**

"Surface sediments" or "sediment(s)" means settled particulate matter located in the predominant biologically active aquatic zone, or exposed to the water column. Sediment(s) also includes settled particulate matter exposed by human activity (e.g., dredging) to the biologically active aquatic zone or to the water column.

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**New definition:**

Contaminated Sediment: ~~Surface S~~sediments designated under the procedures of WAC 173-204-310 as exceeding the applicable sediment quality standards of WAC 173-204-320 through 173-204-340 including narrative, biological, and chemical criteria. (This may need to be modified if HH is included in the rule.)

**Current definition:**

"Contaminated sediment" means sediments designated under the procedures of WAC 173-204-310 as exceeding the applicable sediment quality standards of WAC 173-204-320 through 173-204-340

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**New definition:**

Active Cleanup Action: Those activities requiring physical implementation whose intent is to result in meeting the cleanup standard. Actions include but are not limited to dredging and capping. Passive actions such as natural attenuation, natural recovery and other time-~~neccesitated~~ dependent actions are not included.

**Current definition:**

None

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**New definition:**

Biologically Active Zone: The area within the sediment in which a majority of benthic macroinvertebrates are generally found. By default this is the uppermost 10 cm ~~of the sediment in~~ marine sediment. Where default criteria are not appropriate or unavailable, Information such as the vertical distribution of benthic macroinvertebrates ~~or depth of anoxic sediments~~ can be gathered for each site to be investigated ~~to-in an~~ attempt to delimit the Site specific biologically active zone.

**Current definition:**

None

***Sediment Cleanup Standards Terminology*** DRAFT 5/29/2010

**“Minimum Cleanup Level”** – as determined in WAC 173-204-520. This term will be omitted and replaced with “Cleanup Screening Level” throughout the document. The “Cleanup Screening Level” is equivalent to the “Minimum Cleanup Level” as defined in Table III of 173-204-520, and represents the upper criteria for protection of benthic organisms.

**MTCA equivalent Terminology**

**Remediation Level** – means a concentration (or other method of identification) of a hazardous substance in sediment above which a particular cleanup action component will be required as part of a cleanup action at a site. (WAC 173-340-200) Remediation levels may be used at sites where a combination of cleanup actions components are used to achieve cleanup levels at the point of compliance. Remediation levels may also be used at sites where the cleanup action involves containment of sediment and at sites conducting interim actions. (Reference WAC 173-340-355 (1)).

(2) Relationship of Remediation Levels to Sediment Cleanup Levels and Sediment Cleanup Standards. Remediation levels are not the same as cleanup levels. A cleanup level defines the concentration of hazardous substances above which a contaminated medium must be remediated in some manner. A remediation level, on the other hand, defines the concentration (or other method of identification) of a hazardous substance in a particular medium above or below which a particular cleanup action component will be used. Remediation levels, by definition, exceed cleanup levels.

Cleanup levels must be established for every site. Remediation levels, on the other hand, may not be necessary at a site. Whether remediation levels are necessary depends on the cleanup action selected. For example, remediation levels would not be necessary if the selected cleanup action removes for off-site disposal all sediment that exceeds the cleanup level at the applicable points of compliance.

A cleanup action that uses remediation levels must meet each of the minimum requirements specified in WAC 173-340-360, including the requirement that all cleanup actions must comply with cleanup standards. Compliance with cleanup standards requires, in part, that cleanup levels are met at the applicable points of compliance. If the remedial action does not comply with cleanup standards, the remedial action is an interim action, not a cleanup action. (Reference WAC 173-340-355 (2)).

**Sediment Cleanup Level** – (equivalent to MTCA “Cleanup Level”) – the concentration or biological effects level that is determined to be protective of human health and the environment under specified exposure conditions. (Reference WAC 173-340-200).

**Sediment Cleanup Standard** (equivalent to MTCA “Cleanup Standard”) – means the standards adopted under RCW 70.105D.030 (2)(d). Establishing sediment cleanup standards requires specification of the following:

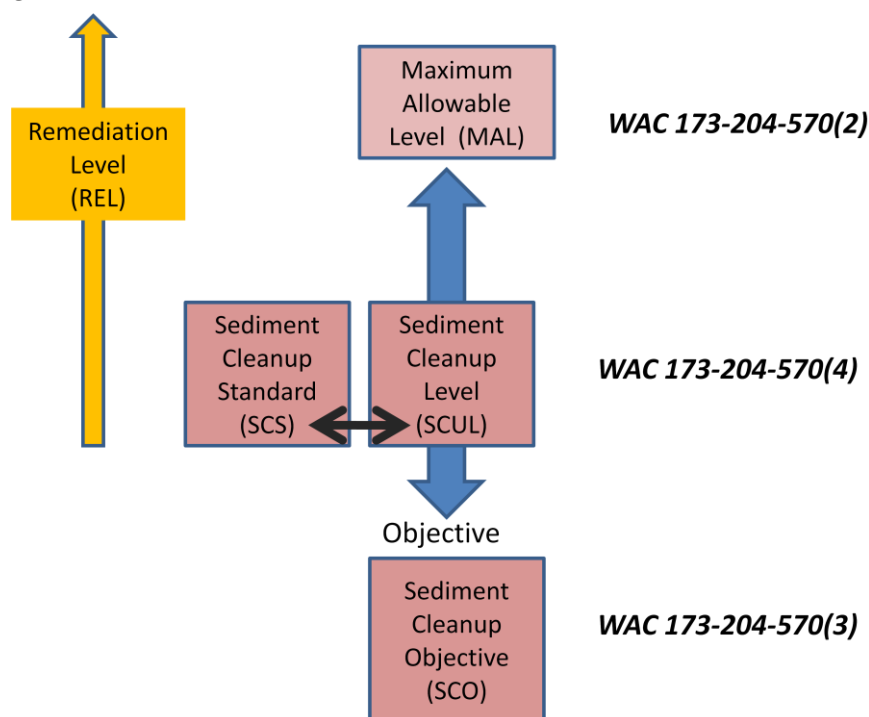
- Hazardous substance concentrations that protect human health and the environment (“sediment cleanup levels”).
- Point of compliance. The location on the site where those sediment cleanup levels must be attained .and
- Additional regulatory requirements that apply to a cleanup action because of the type of action and/or the location of the site. These requirements are specified in applicable state and federal laws and are generally established in conjunction with the selection of a specific cleanup action. (Reference WAC 173-340-200).

## **Sediment Management Standards Unique Terminology**

**Sediment Cleanup Objective** (currently in SMS) – This defines the lower end of the range for setting cleanup standards and is the desired goal at cleanup sites. “The sediment cleanup objective identifies sediments that have no acute or chronic adverse effects on biological resources, and which correspond to no significant health risk to humans, as defined in this chapter.” (WAC 173-204-570(2)).

**Maximum Allowable Level** (new term) – This defines the upper end of the range for setting cleanup standards and is defined in WAC 173-204-570(3).

Figure 1: **Remediation Levels** are related to what actions will be taken at the site and may be set above the cleanup level. The **Sediment Cleanup Level** is the concentration that is the final cleanup level. The sediment cleanup level is set in a range between the **Sediment Cleanup Objective** and the **Maximum Allowable Level**.



## **How will these terms be used in the Sediment Management Standards?**

The term “Minimum Cleanup Levels” will be omitted from Section 173-204-520, “Cleanup Screening Levels” will be used alone in that Section.

### **Setting Sediment Cleanup Standards in WAC 173-204-570**

Provided below is a general description of how the changes in terminology and changes in structure may be applied to the Cleanup Standards section of the Sediment Management Standards. **This is NOT intended to be exact rule language. Other revisions to this section may apply. This is only to illustrate how the terminology is used.**

Figure 2 illustrates the structure of possible revisions to the Sediment Management Standards. Figure 3 shows the current structure of the Sediment Management Standards cleanup standards.

**Section 173-204-570(2)** establishes the “cleanup objective” or the lower end of the range for setting sediment cleanup standards. This will be referred to with the term “**Sediment Cleanup Objective**” (SCO).

The **Sediment Cleanup Objective** shall be the **highest** of:

- a) **Effects–based cleanup levels.** The effects based cleanup levels shall consider site exposure pathways and receptors and be the **lowest** of:
  - i. Sediment Quality Standards as defined in WAC 173-204-320 through WAC 173-204-340.
  - ii. <Human Health narrative (or reference to section with Human Health narrative)>
  - iii. <Ecological bioaccumulation narrative(or reference to section with Ecological bioaccumulation narrative)>
  - iv. Other applicable state and federal laws.
- b) < **Background narrative**>
- c) **Practical Quantitation Limits**

**Section 173-204-570(3)** – establishes the “maximum allowable level” (formerly “minimum cleanup level”) that is permissible at a site after completion of the active cleanup action. This is the upper end of the range for setting cleanup standards. This will be referred to as “**Maximum Allowable Level**” (MAL).

The **Maximum Allowable Level** shall be the **highest** of:

- a) **Effects–based cleanup levels.** The effects based cleanup levels shall consider site exposure pathways and receptors and be the **lowest** of:
  - i. Cleanup Screening Levels as defined in WAC 173-204-520.
  - ii. <Human Health narrative>
  - iii. <Ecological bioaccumulation narrative>
  - iv. Other applicable state and federal laws.
- b) < **Other Background narrative?**>
- c) **Practical Quantitation Limits**

**Section 173-204-570(4)** – establishes the “**Sediment Cleanup Level**” and “**Sediment Cleanup Standard**”.

(a) **Sediment Cleanup Level** is the concentration or biological effects level that is determined to be protective of human health and the environment under specified exposure conditions at a site.

(b) **Sediment Cleanup Standard** (equivalent to MTCA “Cleanup Standard”) – means the standards adopted under RCW 70.105D.030 (2)(d). Establishing sediment cleanup standards requires specification of the following:

- Hazardous substance concentrations that protect human health and the environment (“sediment cleanup levels”).
- Point of compliance. The location on the site where those sediment cleanup levels must be attained .and
- Additional regulatory requirements that apply to a cleanup action because of the type of action and/or the location of the site. These requirements are specified in applicable state and federal laws and are generally established in conjunction with the selection of a specific cleanup action. (Reference WAC 173-340-200).

(c ) The **Sediment Cleanup Level** is established on a site-specific basis within an allowable range of contamination. The lower end of the range is defined in **-570(2) as the Sediment Cleanup Objective**. The upper end of the range is defined in **-570(3) as the Maximum Allowable Level**. The site-specific cleanup levels shall be as close as practicable to the sediment cleanup objective, but in no case shall exceed the maximum allowable level. “For any given cleanup action, either a site-specific sediment cleanup standard shall be defined, or multiple site unit sediment cleanup standards shall be defined. In all cases, the cleanup standards shall be defined in consideration of the net environmental effects (including the potential for natural recovery of the sediments over time), cost and engineering feasibility of different cleanup alternatives, as determined through the cleanup study plan and report standards of WAC 173-204-560.”

(d) <Possible discussion about points of compliance for different exposure pathways and background.>

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Figure 2 shows the structure of possible revisions to the Sediment Management Standards, including new terminology.

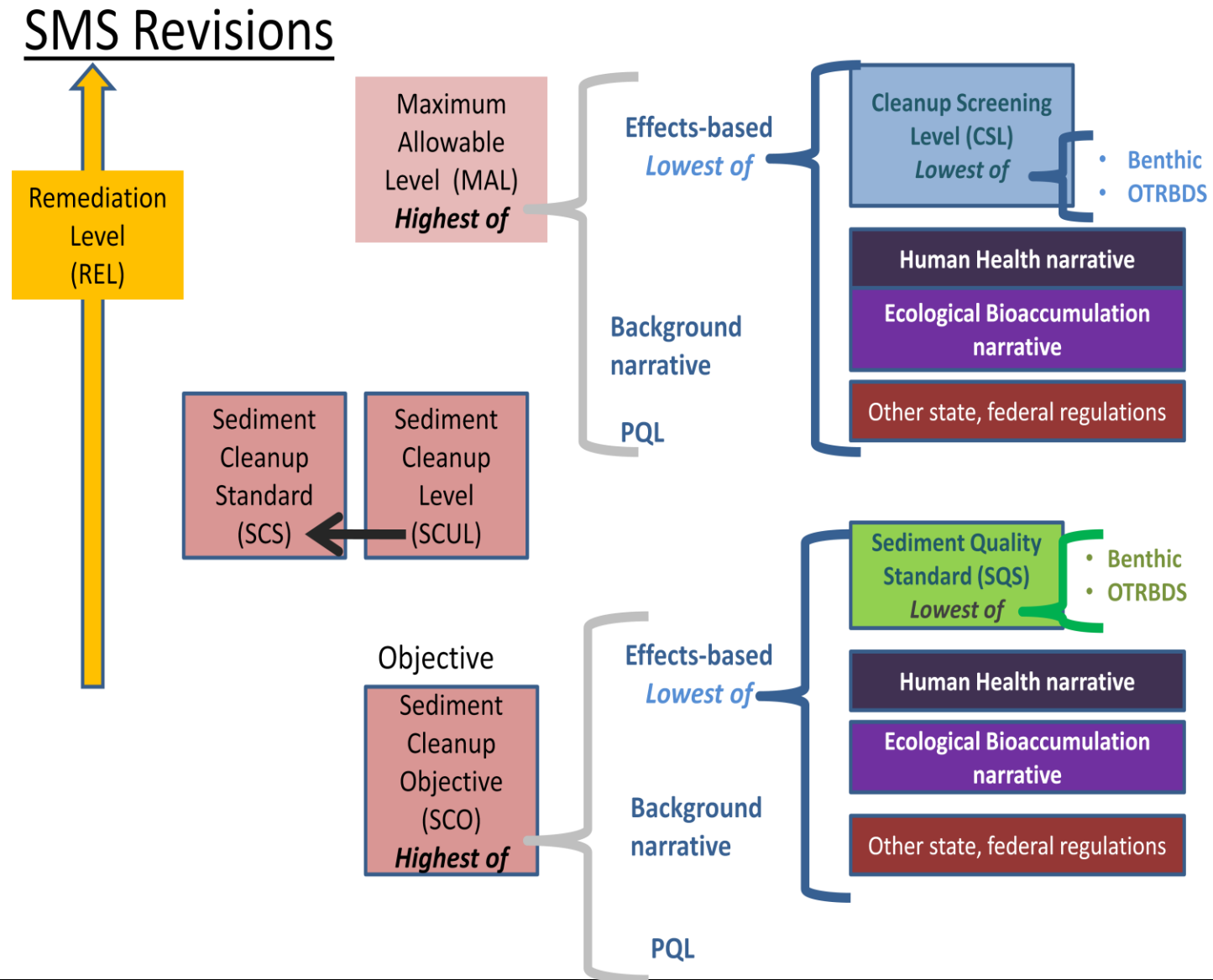
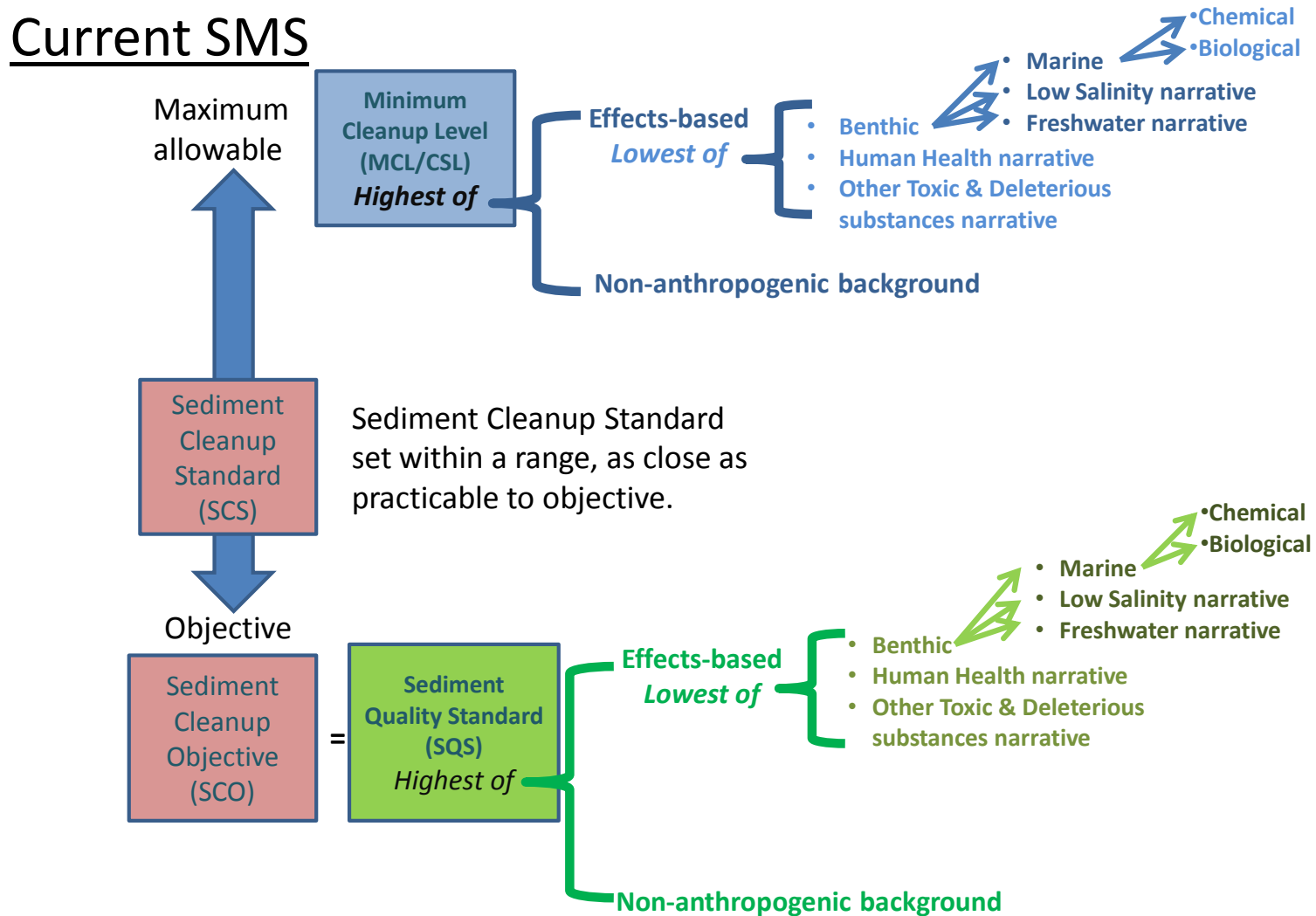


Figure 3: The structure of the current Sediment Management Standards.



**Sediment Management Standards**

**WAC 173-204-570 Sediment cleanup standards.** (1) Applicability and purpose. This section establishes the sediment cleanup standards requirements for cleanup actions required under authority of chapter 90.48 and/or 70.105D RCW, and/or this chapter, and describes the process to determine site-specific cleanup standards.

(2) Cleanup objective. The sediment cleanup objective shall be to eliminate adverse effects on biological resources and significant health threats to humans from sediment contamination. The sediment cleanup objective for all cleanup actions shall be the sediment quality standards as defined in WAC 173-204-320 through 173-204-340, as applicable. The sediment cleanup objective identifies sediments that have no acute or chronic adverse effects on biological resources, and which correspond to no significant health risk to humans, as defined in this chapter.

(3) Minimum cleanup level. The minimum cleanup level is the maximum allowed chemical concentration and level of biological effects permissible at the cleanup site to be achieved by year ten after completion of the active cleanup action.

(a) The minimum cleanup levels criteria of WAC 173-204-520 shall be used in evaluation of cleanup alternatives per the procedures of WAC 173-204-560, and selection of a site cleanup standard(s) per the procedures of this section.

(b) The Puget Sound marine sediment minimum cleanup level is established by the following:

(i) Sediments with chemical concentrations at or below the chemical criteria of Table III shall be determined to meet the minimum cleanup level, except as provided in (b)(iv) of this subsection; and

(ii) Sediments with chemical concentrations that are higher than the chemical criteria of Table III shall be determined to exceed the minimum cleanup level, except as provided in (b)(iii) of this subsection; and

(iii) Sediments with biological effects that do not exceed the levels of WAC 173-

204-520(3) shall be determined to meet the minimum cleanup level; and

(iv) Sediments with biological effects that exceed the levels of WAC 173-204-520(3) shall be determined to exceed the minimum cleanup level; and

(v) Sediments which exceed the sediment minimum cleanup level human health criteria or the other toxic, radioactive, biological, or deleterious substances criteria or the nonanthropogenically affected criteria of WAC 173-204-520 as determined by the department, shall be determined to exceed the minimum cleanup level.

(4) Sediment cleanup standard. The sediment cleanup standards are established on a site-specific basis within an allowable range of contamination. The lower end of the range is the sediment cleanup objective as defined in subsection (2) of this section. The upper end of the range is the minimum cleanup level as defined in subsection (3) of this section. The site specific cleanup standards shall be as close as practicable to the cleanup objective but in no case shall exceed the minimum cleanup level. For any given cleanup action, either a site-specific sediment cleanup standard shall be defined, or multiple site unit sediment cleanup standards shall be defined. In all cases, the cleanup standards shall be defined in consideration of the net environmental effects (including the potential for natural recovery of the sediments over time), cost and engineering feasibility of different cleanup alternatives, as determined through the cleanup study plan and report standards of WAC 173-204-560.

(5) All cleanup standards must ensure protection of human health and the environment, and must meet all legally applicable federal, state, and local requirements.

[Statutory Authority: Chapters 43.21C, 70.105D, 90.48, 90.52, 90.54 and 90.70 RCW. 91-08-019 (Order 90-41), § 173-204-570, filed 3/27/91, effective 4/27/91.]